

REMARKS

The Official Action dated March 23, 2005 has been received and its contents carefully noted. In view thereof, claims 2, 3, 5, 6 and 9 have been canceled in their entirety without prejudice nor disclaimer of the subject matter set forth therein and claims 1, 4, 7, 8, 10-15 and 17 have been amended in order to better define that which Applicants regard as the invention. Accordingly, claims 1, 4, 7, 8 and 10-17 are presently pending in the instant application.

Initially, Applicants wish to acknowledge the Examiner's indication that in response to Applicants' Request for Reconsideration filed February 16, 2005, the finality of the previous Office Action has been withdrawn. In view of the foregoing amendments, it is respectfully requested that the rejection set forth in the present Office Action likewise be reconsidered and withdrawn by the Examiner and that the application be passed to issue.

With reference now to Section 1 of the Office Action, claims 1, 3, 4, 6-9 and 11 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,160,456 issued to Lahn. This rejection is respectfully traversed in that the patent to Lahn neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

As can be seen from the foregoing amendments, independent claim 1 recites a hydrogen gas generator for generating hydrogen from a source fuel of the hydrocarbon family, oxygen and steam where the hydrogen gas generator includes a fuel reformer with a catalyst which exhibits an activity to a partial oxidation reaction of a source fuel, wherein the source fuel, oxygen and the steam are supplied to the reformer such that within the reformer, the partial oxidation reaction occurs on the catalyst and a water gas shift reaction occurs in which CO produced in the partial oxidation reaction is a reactant, the O_2/C ratio which is the ratio of the number of moles of oxygen to the number of moles of carbon of the source fuel, it is not less than 0.9 times the CO/C theoretical mixture ratio in the partial oxidization reaction,

the H_2O/C ratio, which is the ratio of the number of moles of steam to the number of moles of carbon of the source fuel, it is not less than .5, the water gas shift reaction is controlled such that the CO_2/CO ratio which is the ratio of CO_2 to CO in an outlet gas of the fuel reformer is not less than 0.2 and the outlet gas temperature of the fuel reformer is not more than $800^{\circ}C$. Clearly, the patent to Lahn neither discloses nor remotely suggests these features.

Particularly, it is noted that Lahn discloses that a water gas shift reaction as well as a steam reforming reaction in a partial oxidation reaction occurs, however, this reference also discloses using a catalyst with little or no water gas shift activity as noted from column 1, lines 51-57. Specifically, Lahn discloses that the steam reforming reaction is activated by setting a bit temperature above approximately $1650^{\circ}F$, and preferably above approximately $1700^{\circ}F$ so that the water gas shift reaction does not substantially occur as noted from column 3, lines 11-13. This is directly contrary to that which is presently set forth by Applicants' claimed invention wherein the steam reforming reaction does not occur while the water gas shift reaction occurs. Accordingly, it is respectfully submitted that Applicants' claimed invention is significantly different from that of Lahn. Furthermore, Lahn fails to disclose that the water gas shift reaction is controlled such that the CO_2/CO ratio, which is a ratio of CO_2 to CO ratio in an outlet gas of the fuel reformer is not less than 0.2 as is specifically set forth by Applicants' claimed invention. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 1 as well as those claims which depend therefrom clearly distinguish over the teachings of Lahn and are in proper condition for allowance.

With reference now to Section 2 of the Office Action, claims 1-5, 11, 13 and 17 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,641,625 issued to Clawson et al. This rejection is respectfully traversed in that the patent to Clawson

et al. neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

In reviewing the Clawson et al. reference, it is noted that this reference discloses that the water gas shift reaction occurs simultaneously with the partial oxidation reaction and that the POx chamber 34 may contain a reforming catalyst. Furthermore, it is noted that Clawson et al. discloses that the carbon monoxide of the gas exiting the shift reactor can be as low as 0.5 mole percent as noted from column 4, lines 45-49. However, the carbon monoxide content is set forth with respect to the gas exiting the shift reactor and not the gas exiting the reformers as set forth by Applicants' claimed invention. Accordingly, it is respectfully submitted that the Clawson et al. reference does not disclose or suggest that which is presently set forth by Applicants' claimed invention which recites that the CO₂/CO ratio, which is the ratio of CO₂ to CO in an outlet gas of the fuel reformer, is not less than 0.2. Therefore, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 1 as well as those claims which depend therefrom clearly distinguish over the teachings of Clawson et al. and are in proper condition for allowance.

With reference now to Section 3 of the Office Action, claims 6-10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Clawson et al. in view of Lahn et al. This rejection is respectfully traversed in that the combination proposed by the Examiner neither discloses nor suggests that which is presently set forth by Applicants' claimed invention.

As discussed hereinabove, neither Clawson et al., nor Lahn et al. when taken alone disclose or suggest that which is presently set forth by Applicants' claimed invention. Furthermore, the combination of the teachings of Clawson et al. and Lahn et al. as proposed by the Examiner, likewise fails to disclose or remotely suggest that which is presently set

forth by Applicants' claimed invention for the reasons discussed in detail hereinabove.

Particularly, as noted hereinabove, the water gas shift reaction of Lahn et al. does not occur in the fuel reformer while Clawson et al. discloses that the water gas shift reaction does occur in the reformers. Consequently, it is respectfully submitted that one of ordinary skill in the art would not combine the references in the manner suggested by the Examiner to reach Applicants' claimed invention. Consequently, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 1 and particularly as set forth in dependent claims 6-10 clearly distinguish over the combination proposed by the Examiner and are in proper condition for allowance.

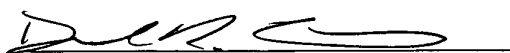
With reference to Sections 4, 5 and 6 of the Office Action, claims 12 and 14-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Clawson et al. as previously applied and further in view of one of U.S. Patent No. 4,186,801 issued to Madgavkar et al., U.S. Patent No. 6,165,633 issued to Negishi and U.S. Patent No. 5,290,641 issued to Harashima. Each of these rejections are respectfully traversed in that the secondary references cited by the Examiner clearly fail to overcome the aforementioned shortcomings associated with Clawson et al. Specifically, while the patent to Madgavkar et al., Negishi and Harashima may disclose various features set forth in dependent claims 12 and 14-16, each of these references clearly fail to disclose or remotely suggest that the CO₂/CO ratio, which is the ratio of CO₂ to CO in an outlet gas of the fuel reformer is not less than 0.2. Accordingly, it is respectfully submitted that Applicants' claimed invention as set forth in independent claim 1 as well as dependent claims 12 and 14-16 distinguishes over the combination proposed by the Examiner and is in proper condition for allowance.

Therefore, in view of the foregoing it is respectfully requested that the rejections of record be reconsidered and withdrawn by the Examiner, that claims 1, 4, 7, 8 and 10-17 be

allowed and that the application be passed to issue.

Should the Examiner believe a further conference would be of benefit in expediting the prosecution of the instant application, he is hereby invited to telephone counsel to arrange such a conference.

Respectfully submitted,



Donald R. Studebaker
Reg. No. 32,815

Nixon Peabody LLP
401 9th Street N.W.
Suite 900
Washington, D. C. 20004
(202) 585-8000